

8.2 Notes Multiplying a Polynomial by a Monomial

Remember Chapter 7:

Expression	Simplified Expression
$a^2 \cdot a^3$	a^5
$4x^2(-3x^4)$	$-12x^6$
$(5w^2y)(6w^3)$	$30w^5y$

When the base variables are the same, then add the exponents.

When multiplying monomials, what do you do with the coefficients? multiply

big #s

Now in Chapter 8: Distribute to everything in the parentheses.!!!

Expression	Simplified Expression
$4x(5x^4 + 2y)$	$20x^5 + 8xy$
$5a^3(a^7 - 7a^3 + b)$	$5a^{10} - 35a^6 + 5a^3b$
$4x^3(x^2 + 2x - 2xy)$	$4x^5 + 8x^4 - 8x^4y$
$2xy(7x^4y^2 + x^5y - 2x)$	$14x^5y^3 + 2x^6y^2 - 4x^2y$

Find each product.

1. $3g(-7g^3 + 5g^2 + 8g - 1)$

$-21g^4 + 15g^3 + 24g^2 - 3g$

2. $-4bc^3(3bc^3 + 8b^2c + 5c)$

3. $12h^5p^3(2h^2p^5 - 7h^2p^7 - 2)$

$24h^7p^8 - 84h^7p^{10} - 24h^5p^3$

Algebra 1C

Sometimes we need to distribute and look for like terms.

1. $3(2t^2 - 4t - 15) + 6t(5t + 2)$

$6t^2 - 12t - 45 + 30t^2 + 12t$

$36t^2 - 45$

2. $2p(-4p^2 + 5p) - 5(2p^2 + 20)$

$-8p^3 + 10p^2 - 10p^2 - 100$

$-8p^3 - 100$

When there's an equals sign in the equation, we need to get the variable by itself.

Steps to solving:

1. Simplify both sides of the equation
 - a. Distribute
 - b. Combine like terms
2. Get variables to one side of the equation
3. Get constants to the other side
4. Solve for the variable

Examples:

$$1. -4(w + 1) + 2w = 2(7 - 4w)$$

$$\boxed{-4w} - 4 + \boxed{2w} = 14 - 8w$$

$$\begin{array}{r} -2w - 4 = 14 - 8w \\ +8w \quad \downarrow \quad +8w \\ \hline 6w - 4 = 14 \\ +4 \quad \quad +4 \\ \hline 6w = 18 \\ \frac{6w}{6} = \frac{18}{6} \end{array}$$

$w = 3$

$$2. 3(y - 2) + 2y = 4y + 14$$

$$3y - 6 + 2y = 4y + 14$$

$$\begin{array}{r} 5y - 6 = 4y + 14 \\ -4y \quad \downarrow \quad -4y \quad \downarrow \\ \hline 1y - 6 = 14 \\ +6 \quad \quad +6 \\ \hline y = 20 \end{array}$$

$$3. x(x - 4) + x(x + 8) = x(x - 13) + x(x + 1) + 16$$

$$\begin{array}{r} \cancel{1x^2} - 4x + \cancel{1x^2} + 8x = \cancel{1x^2} - 13x + \cancel{1x^2} + x + 16 \\ \hline 2x^2 + 4x = 2x^2 - 12x + 16 \\ -2x^2 \quad \downarrow \quad -2x^2 \quad \downarrow \quad \downarrow \\ \hline 4x = -12x + 16 \\ +12x \quad \quad +12x \quad \downarrow \\ \hline 16x = 16 \\ \frac{16x}{16} = \frac{16}{16} \end{array}$$

$x = 1$